The Heart Surgery Forum #2006-1002
9 (3), 2006 [Epub April 2006]
doi:10.1532/HSF98.20061002

Online address: http://cardenjennings.metapress.com/link.asp?id=112496

Where Have All the Cardiothoracic Surgery Residents Gone? Placement of Graduating Residents by United States Thoracic Surgery Training Programs, 1998 to 2002

Dr. Wheatley

Grayson H. Wheatley III, MD,[1] Richard Lee, MD, MBA[2]

[1]Department of Cardiovascular Surgery, Arizona Heart Institute, Phoenix, Arizona;
[2]Department of Cardiothoracic Surgery, Saint Louis University, Saint Louis, Missouri, USA

ABSTRACT

Objective. We studied the evolving job placement trends of graduating cardiothoracic surgery residents over a 5-year period from the perspective of the program director.

Methods. Graduate placement questionnaires were sent to program directors of Accreditation Council for Graduate Medical Education–accredited United States thoracic surgery residency programs (n = 92). Program directors were asked to categorize the type of job that each resident chose upon graduation (1998-2002).

Results. Of the program directors surveyed, 71.7% (66/92) responded, representing 76.4% (545/714) of the total graduating resident population during the study period. Three-year training programs constituted 24.2% (16/66) of the respondents and accounted for 20.2% (110/545) of the graduates. Annually, graduates most commonly chose private practice jobs. Between 2001 and 2002, the percentage of graduates entering fellowships increased (11.8% [13/110] versus 19.1% [21/110], $P = .008$) as the percentage of graduates choosing private practice positions decreased (56.4% [62/110] versus 45.5% [50/110], $P = .15$). In total, 12.8% (70/545) of the graduates pursued fellowships, with associated specialty choices being: 38.6% (27/70) adult cardiac, 37.1% (26/70) congenital, 15.7% (11/70) transplantation, and 8.6% (6/70) thoracic. There were no significant differences between 2-year and 3-year training program graduates in choice of private practice versus academic jobs.

Conclusions. In 2002, a greater percentage of graduates chose to pursue fellowship training at the expense of private practice employment. This difference may in part result from fewer employment opportunities rather than graduate choice. Ongoing studies are needed to follow this trend. Annual analysis of the placement of all graduating residents would help to identify changes in employment.

Received January 12, 2006; accepted February 6, 2006.

Presented at the 31st Annual Meeting of The Western Thoracic Surgical Association, Victoria, British Columbia, Canada, June 22 to 25, 2005.

Address correspondence and reprint requests to: Grayson H. Wheatley III, MD, 2632 N 20th Street, Phoenix, AZ 85006, USA; 1-214-604-5261; fax: 1-206-240-6160 (e-mail: Gwheatley@azheart.com).

INTRODUCTION

Graduate medical education (GME), or residency education, is responsible for preparing physicians for the independent practice of medicine. Although the overall mission of GME has remained unchanged from its initial beginnings, the process of how best to achieve this goal has evolved in association with changes in the way medicine is practiced and health care is delivered. Additionally, each of the governing specialty boards have driven their respective GME curriculums and maintained a uniform quality of finishing residents through Residency Review Committees and standardized board examinations. The pace at which new medical advances are being introduced appears to be accelerating across specialties, and the possibility of even more profound changes in the way we treat patients, such as molecular medicine, nanotechnology, and genomics, are fast approaching [Collins 1999; Gerling 2003]. These developments, although good for patients, present a challenge for both medical educators and residents. Medical and surgical specialties must adequately prepare their graduates for the rapidly changing medical landscape while at the same time sustaining an essential fund of knowledge and a core curriculum that produces the highest quality practicing physicians.

In particular, the specialty of thoracic surgery (TS) has traditionally been a leader in GME [Gay 1998; Crawford 2005]. With nationally recognized medical educators such as Lilehei, Debakey, and Cooley, TS has attracted significant interest by medical students and been one of the most competitive residency matching programs. However, finishing TS residents have recently expressed concern about obtaining suitable employment [Lee 2003]. Much of the information about the perceived lack of employment opportunities for finishing residents has been anecdotal and obtained through subjective surveys [Salazar 2004]. To better understand the evolving job placement trends of graduating United States (US) TS residents, we sought the input and perspective of TS program directors (PD) by directly querying them concerning the placement of all of their graduating residents between 1998 and 2002.

Table 1. Sample Questions from Job Placement Questionnaire Sent to Thoracic Surgery Program Directors

Approved Length of Residency Program: ☐ 2 years ☐ 2.5 years ☐ 3 years		
Approved Number of Residency Positions per Year: _____		
Graduating Resident #1:		
Resident Gender:	☐ Male	☐ Female
Job Placement:		
Private Practice	☐ Adult Cardiac	
	☐ Thoracic	
	☐ Combined	
	☐ Congenital	
Academic	☐ Adult Cardiac	
	☐ Thoracic	
	☐ Combined	
	☐ Congenital	
Fellowship	☐ Adult Cardiac	
	☐ Thoracic	
	☐ Congenital	
	☐ Transplantation	
	☐ Military Commitment	
	☐ Other, specify:	

METHODS

Questionnaires were sent to all 92 TS PD of Accreditation Council for Graduate Medical Education (ACGME)-approved US training programs as of June 30, 2002. PD were asked to provide the approved length of their residency training program (2-year or 3-year) and whether they had separate residency tracks, such as a dedicated thoracic tract or a dedicated cardiac tract. PD were also asked to provide the number of ACGME-approved graduating residency spots for their program for each of the years in the study (1998-2002). In addition to resident gender, detailed categorization (private practice, academic, or fellowship) of the placement of individual graduating residents for each responding program was obtained and correlated with an associated residency track for that particular resident. A sample questionnaire for a single graduating resident is listed in Table 1.

Three attempts were made to provide questionnaires to each PD over a 2-month period. The first attempt to distribute the questionnaire was by US Postal Service, and 2 subsequent attempts were made by e-mail. Completed questionnaires were returned either by US Postal Service, facsimile, or e-mail. Table 2 represents an anonymous example of a completed questionnaire. Data from responding programs were entered into a Microsoft (Redmond, WA, USA) Excel spreadsheet, and in addition to standard statistical analysis, a Student *t* test was performed using Excel.

RESULTS

Responses were received from 71.7% (66/92) of the PD, representing 76.4% (545/714) of the total graduating resident population during the study period. The number of graduating residents per year captured in this study remained relatively stable as compared to the total graduating pool of residents (Table 3). Male graduates represented 96.3% (525/545) of the total number of residents captured, and the ratio of male to female graduating residents remained consistent for each year throughout the study period. Three-year training programs constituted 24.2% (16/66) of the responding programs and accounted for 20.2% (110/545) of the total graduates. Specialty tracts were offered by 10.6% (7/66) of the responding programs.

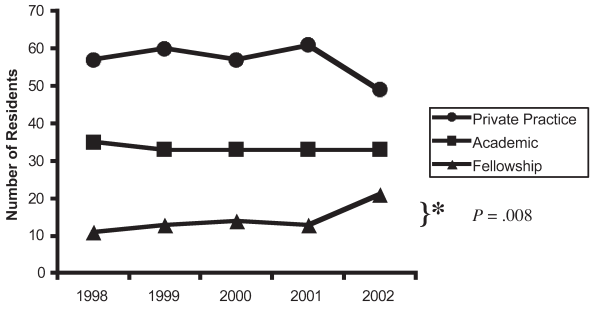

Figure 1. Overall job placement from 1998 to 2002 for graduating thoracic surgery residents (n = 545).

More graduating residents chose private practice jobs over academic jobs or fellowship positions for each year in the study period (Figure 1). The relative number of graduating residents choosing a particular type of job opportunity remained consistent from 1998 to 2001. However, from 2001 to 2002, the percentage of graduates entering fellowships increased (11.8% [13/110] versus 19.1% [21/110], $P = .008$) at the expense of private practice positions (56.4% [62/110] versus 45.5% [50/110], $P = .15$). The number of graduates choosing academic positions remained stable throughout the study period. Most graduating residents choosing a private practice career appeared to go into combined cardiothoracic surgery practices rather than cardiac or thoracic alone. There was little change in the private practice pattern throughout the study period (Figure 2). However, the practice patterns of residents choosing academic employment opportunities were less consistent. In 2002, more graduating residents chose predominately cardiac-oriented practices at the expense of primarily thoracic-oriented practices (Figure 3).

In total, 12.8% (70/545) of the entire pool of residents pursued fellowship training following graduation, with associated specialty training choices being: 38.6% (27/70) adult cardiac, 37.1% (26/70) congenital, 15.7% (11/70) transplantation, and 8.6% (6/70) thoracic. There were no significant differences between 2-year and 3-year training program graduates in choice of private practice jobs (57.7% [251/435] versus 52.7% [58/110], P = NS), academic jobs (29.0% [126/435] versus 36.4% [40/110], P = NS) or fellowships (13.3% [58/435] versus 10.9% [12/110], P = NS).

DISCUSSION

TS as a specialty is currently faced with many challenges, including declining operative case volumes and decreased physician reimbursement [Lytle 2005]. These challenges are having a significant impact on both practicing cardiothoracic

Table 2. Sample Graduating Resident Placement Data from a Single Thoracic Surgery Residency Program

	1998 Resident #1	1999 Resident #1	2000 Resident #1	2001 Resident #1	2002 Resident #1
Gender	Male	Male	Male	Male	Male
Training	Combined	Combined	Combined	Combined	Combined
Tract	2 year	2 year	2 year	2 year	2 year
Placement	Private Practice: Cardiac	Private Practice: Cardiac	Private Practice: Combined	Private Practice: Combined	Private Practice: Cardiac
	Resident #2	Resident #2	Resident #2	Resident #2	Resident #2
Gender	Male	Male	Male	Male	Male
Training	Combined	Combined	Combined	Combined	Combined
Tract	2 year	2 year	2 year	2 year	2 year
Placement	Private Practice: Combined	Academic: Combined	Academic: Combined	Fellowship: Congenital	Fellowship: Congenital

surgeons and TS residents. In particular, residents are concerned about their future employment opportunities. A recent survey of graduating TS residents, administered during their last month of training, discovered that almost 20% of respondents received no job offers prior to graduation [Salazar 2004]. Similarly, the number of TS job opportunities that were advertised in a major medical journal declined over the last several years [Wheatley 2005b].

This uncertainty about future employment opportunities has had many effects on residents currently in training. First, it has caused a significant number of residents to reconsider their specialty choice. In the same graduating resident survey mentioned above, 25% of respondents either strongly disagreed or disagreed when asked if they would again choose to become a cardiothoracic surgeon [Salazar 2004]. Second, some residents are discouraging medical students and general surgery residents from applying for the TS residency matching program. Finally, residents who are unable to find a job are looking for other employment options, such as fellowship positions to extend the length of time they have to find a job and to obtain additional technical skills.

This trend of graduating residents increasingly choosing a fellowship position is reflected in the information we were able to obtain from the responding TS training programs. We chose to study the period from 1998 to 2002 because this is the period of time when operative case volumes began declining. The beginning of this 5-year period captures the job market when case volumes were steady and percutaneous interventions were not yet significantly impacting the job market, and the latter part of the study period captures the initial downward trend in the perceived lack of jobs and decline in operative case volumes [Baumgartner 2003].

A proposed potential strategy to assist residents in finding jobs, and increase their marketability, is to extend the length of residency training to increase technical proficiency, gain additional skills, and allow the resident more time to find a job. Currently, almost 25% of the TS residency training programs are 3 years in length. However, we did not find a significant difference between 2-year and 3-year training program graduates in placement, and 3-year training program graduates were just as likely as 2-year program graduates to seek additional training.

Therefore, extending the duration of training does not appear to help graduates find jobs. The additional fellowship training that graduating residents seek is often in a subspecialty area that is in high demand, such as atrial fibrillation surgery, beating heart surgery, or endovascular surgery, and these skills are not usually included in the standard training curriculum [Gardner 2004; Kron 2004; Wheatley 2005a]. It may be that the residency curriculum could be revised to better include these high-demand skills during the traditional residency period, and therefore graduating residents would be initially more marketable and not find it necessary to seek additional

Table 3. Number of Thoracic Surgery Graduating Residents per Year for which Job Placement Information Was Obtained

Graduation Year	Number of Graduating Residents	Total Graduating Residents
1998	106	141
1999	110	143
2000	109	148
2001	109	143
2002	111	141

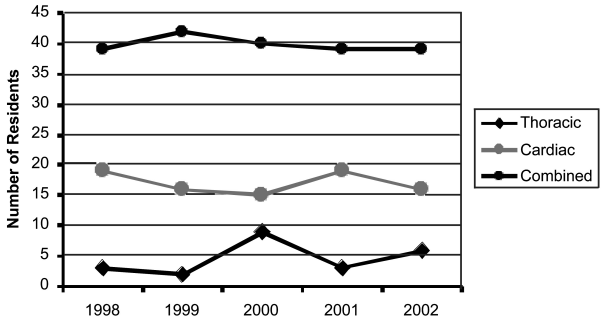

Figure 2. Intended practice pattern of graduating thoracic surgery residents going into private practice, 1998 to 2002.

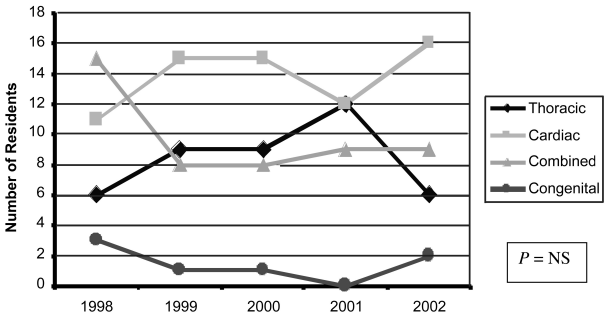

Figure 3. Intended practice pattern of graduating thoracic surgery residents going into academic practice, 1998 to 2002.

technical training. Some residents and surgeons have suggested drastically limiting the number of training positions. Unfortunately, this type of training spot adjustment is not permitted under ACGME guidelines, and fails to address the broader specialty challenges. In addition, limiting the number of training spots may lead to a severe work force shortage in 10 to 20 years.

The lack of jobs for graduating residents is a symptom of a larger problem within the specialty [Gardner 2002]. It is also a call to innovate and change the way we practice and the way we train our residents [Cosgrove 2000; Olinger 2001]. Without adapting to the new market forces, our specialty will not be able to remain leaders professionally or in GME. A number of potential solutions and future directions for reinvigorating our specialty have been proposed [Wechsler 1998; Baumgartner 2005]. But these solutions require new skills and new technical knowledge that many practicing surgeons do not already possess, such as endovascular skills, and it is difficult and financially challenging for practicing surgeons to retrain to acquire these skills.

A potentially better solution for the broader profession is to train and graduate residents who possess these new and innovative skills, and who can bring these skills to established practices [Grillo 1996; DaRosa 2000]. TS is not the only specialty that is experiencing a perceived training gap. Even internal medicine graduates, a specialty where graduating residents are not struggling to find suitable employment, have expressed concern about the discrepancy between the skills that they are learning and the skills they will need to practice [Arora 2005]. For TS, this approach would mean incorporating new skills, such as catheter and guide-wire skills, and a reliance on new technologies. Several authors have recognized this training gap in TS; however, new training paradigms and curriculums have yet to be meaningfully implemented [Wilcox 1998; DaRosa 2000]. This lack of implementation attests to the fact that proposing and implementing these changes at the program or even societal level is challenging, and continued efforts are needed.

Another important consequence of revising the training curriculum would be to renew interest in our specialty for medical students and general surgery residents. For the first time since the national matching program began, this year there were more training spots available than applicants. In addition to offering a new and vibrant curriculum, training programs need to directly recruit medical students by serving as mentors and lecturing to general surgery residents on the exciting aspects of being a thoracic surgeon. This type of interventional program has been documented to work for other general surgeons [Kozar 2003; Brundage 2005]. Another more radical approach to the training problem is to potentially partner with cardiologists, radiologists, and interventionalists to "morph" our training into a broader "cardiovascular specialist" training [DeMaria 2005].

This study has several limitations. This is a survey-based study, and therefore the inherent limitations of less-than-complete participation are present. However, we were able to obtain responses from 72% of the programs, and given that the PD turnover is almost 20% per year, this response rate is not unreasonable. Unlike some other survey studies, the information collected in this study is objective rather than subjective. We did not provide formal definitions of what an "academic" or "private practice" position was, but left that decision to the discretion of the PD. This wording may have introduced a slight bias in favor of academic job placements, because this term can be interpreted in several ways. Another limitation in our study was that some of the newer PD may have been answering the questionnaire for residents who graduated prior to their tenure as PD. Because this information is not usually archived, some of the specific job placement information for the earlier years in the study may not have been as accurate as the later years. Finally, it is difficult to draw conclusions based on a 1-year up turn or down turn in the data, such as choice of fellowship, but this change correlates well with the rest of the perceived trends occurring in the specialty as a whole.

We believe that it is important both for residency training programs and the specialty at large that continued efforts at graduating resident job placement database collection be pursued. This information would be helpful in understanding the changing dynamics of the marketplace and the success of residency programs in placing their residents. Residency programs that are successful in placing their residents in academic jobs could use this information to their advantage to attract academically inclined applicants. Likewise, medical students and general surgery residents could look at the placement trends and success of particular programs to assist in choosing a program that best reflects their future career interests. A more challenging task, but just as important, would also be to track the recently graduated residents for the first 5 years in practice to assess changes in practice patterns and career choices.

CONCLUSION

Job placement of graduating cardiothoracic surgery residents is changing. More residents are choosing to pursue additional fellowship training at the expense of private practice employment. This decision may in part be driven by fewer employment opportunities rather than resident choice. Ongoing studies are needed to follow this trend, and creative efforts by the cardiothoracic surgery community may be necessary to develop additional employment opportunities for graduating residents.

ACKNOWLEDGMENTS

We thank all of the TS PD who generously participated in this study. We also thank the Thoracic Surgery Directors Association for their continued support on behalf of resident education and their ongoing encouragement of the Thoracic Surgery Residents Association. All authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

REFERENCES

Arora V, Guardiano S, Donaldson D, Storch I, Hemstreet P. 2005. Closing the gap between internal medicine training and practice: recommendations from recent graduates. Am J Med 118:680-5.

Baumgartner WA. 2003. Cardiothoracic surgery: a specialty in transition—good to great? Ann Thorac Surg 75:1685-92.

Baumgartner WA, Burrows S, del Nido PJ, et al. 2005. Recommendations of the National Heart, Lung, and Blood Institute Working Group on future direction in cardiac surgery. Circulation 111:3007-13.

Brundage SI, Lucci A, Miller CC, Azizzadeh A, Spain DA, Kozar RA. 2005. Potential targets to encourage a surgical career. J Am Coll Surg 200:946-53.

Collins FS. 1999. Shattuck lecture—medical and societal consequences of the Human Genome Project. N Engl J Med 341:28-37.

Cosgrove DM. 2000. The innovation imperative. J Thorac Cardiovasc Surg 120:839-42.

Crawford FA Jr. 2005. Thoracic surgery education—past, present, and future. Ann Thorac Surg 79:S2232-7.

DaRosa DA, Fullerton DA, Kron IL, Orringer MB. 2000. Content of thoracic residency training and its relevance to the practice of medicine. Ann Thorac Surg 69:1321-6.

DeMaria AN. 2005. The morphing of cardiovascular specialists. J Am Coll Cardiol 45:960-1.

Gardner, TJ. 2002. Presidential address: our heritage and our future. J Thorac Cardiovasc Surg 124:649-54.

Gardner TJ. 2004. Residency training for the future, not the past. Ann Thorac Surg 78:1519-21.

Gay WA Jr. 1998. Graduate education in thoracic surgery and the American Board of Thoracic Surgery. Semin Thorac Cardiovasc Surg 10:178-80.

Gerling IC, Solomon SS, Bryer-Ash M. 2003. Genomes, transcriptomes, and proteomes: molecular medicine and its impact on medical practice. Arch Intern Med 163:190-8.

Grillo HC. 1996. The education and qualification of thoracic surgeons in the USA. Int Surg 81:218-23.

Kozar RA, Lucci A, Miller CC, et al. 2003. Brief intervention by surgeons can influence students toward a career in surgery. J Surg Res 111:166-9.

Kron IL, Mathisen D. 2004. Caring for the residents: the view of two program directors. Ann Thorac Surg 78:17.

Lee R. 2003. Help wanted. Ann Thorac Surg 76:1779-81.

Lytle B, Mack M. 2005. The future of cardiac surgery: the times, they are a changin'. Ann Thorac Surg 79:1470-2.

Olinger GN. 2001. "Change in the wind": report from the 2000 Thoracic Surgery Directors Association retreat on Thoracic Surgery Graduate Medical Education. Ann Thorac Surg 72:1433-7.

Salazar JD, Lee R, Wheatley GH 3rd, Doty JR. 2004. Are there enough jobs in cardiothoracic surgery? The thoracic surgery residents association job placement survey for finishing residents. Ann Thor Surg 78:1523-7.

Wheatley GH 3rd. 2005. A recent graduate's perspective on residency training. Ann Thorac Surg 80:382.

Wheatley GH 3rd. 2005. Job availability for finishing cardiothoracic surgery residents. Ann Thorac Surg 79:384.

Wechsler AS. 1998. The Joint Committee for Thoracic Surgery education. Semin Thorac Cardiovasc Surg 10:186-7.

Wilcox BR. 1998. Graduate education in thoracic surgery and the American College of Surgeons. Semin Thorac Cardiovasc Surg 10:169-72.